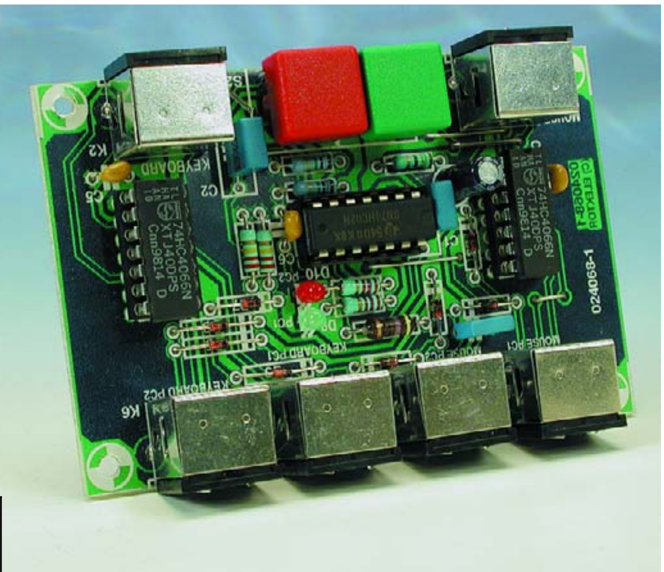
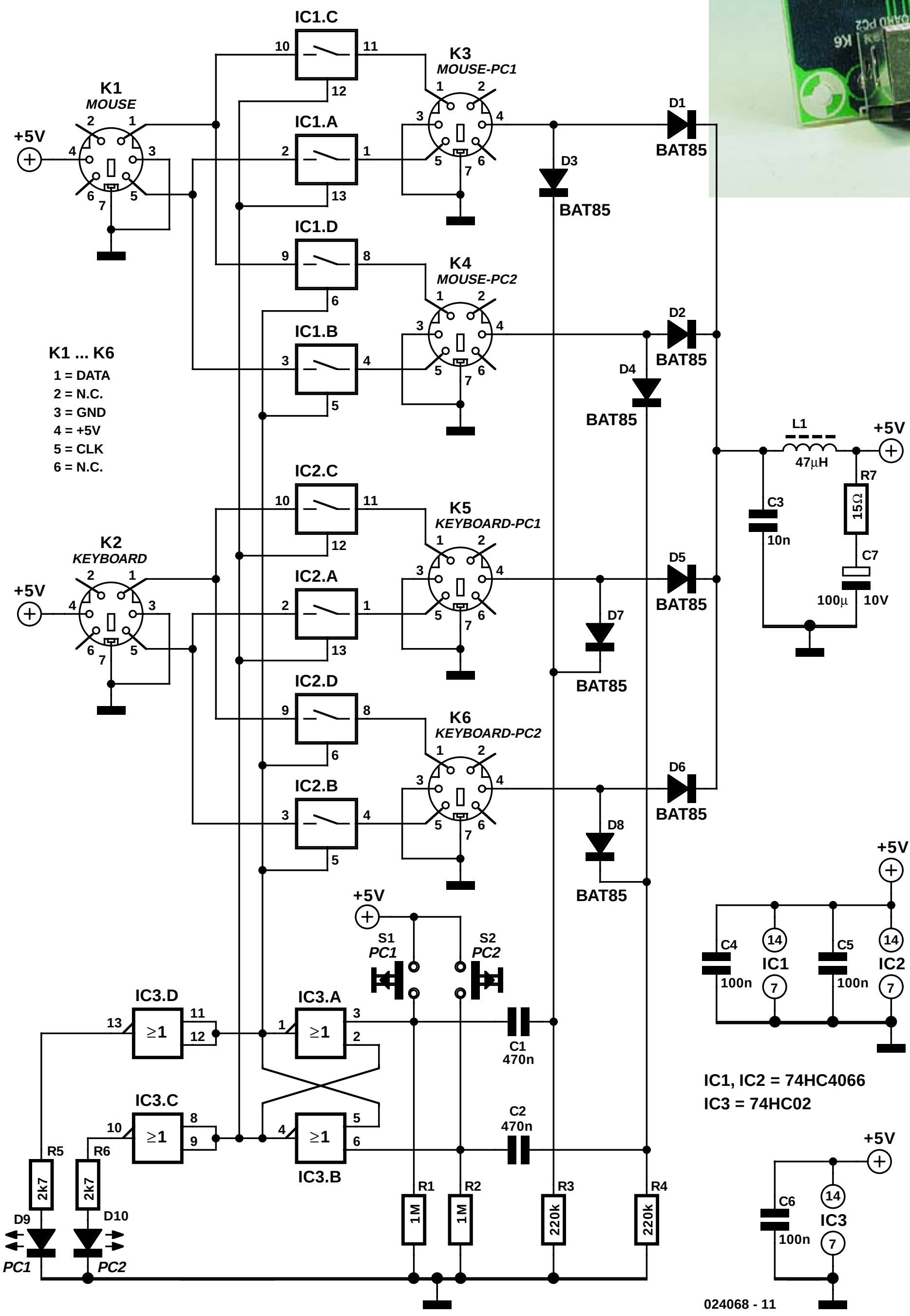
Keyboard/Mouse Changeover Switch

030

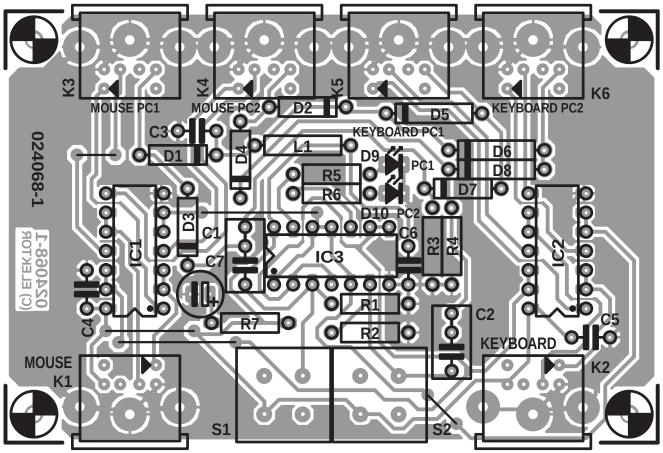
Old PCs are usually not immediately discarded after the purchase of a new one, but often remain in use for certain tasks. To avoid being tied to two keyboards and two mice when operating two PCs it would be nice if there was some kind of simple switch that would easily change the keyboard and mouse over from one PC to the other. That is the purpose of this circuit. The connections are made with four PS/2-cables (male/male). If one of the PCs requires a 5-pin DIN connector, an adapter cable or plug is also necessary. For the mouse an adapter plug from PS/2 to 9-pin Sub-D is also available, if required.

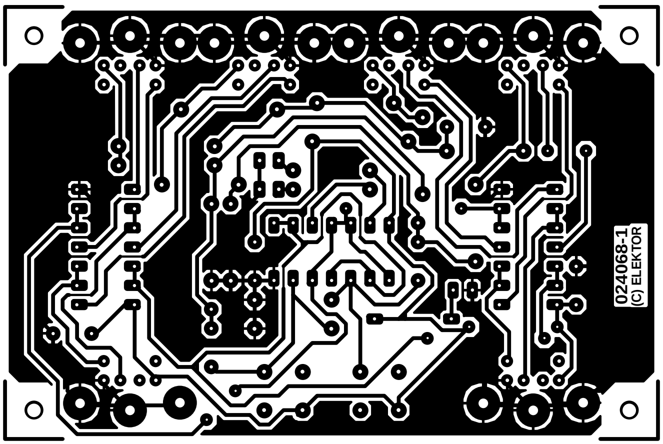




The operation of the whole circuit is quite simple. The power supply is obtained, with the aid of diodes D1, D2, D5 and D6, from the four connections to the PCs. Only one of the connections, K3 through to K6, to the PC needs to be powered up for this circuit to operate. L1 prevents any noise that may be present on the PC power supply from reaching the circuit. The power supply so obtained is directly connected with the keyboard and mouse.

Standard analogue switches from the HC-logic family (74HC4066) are used for the changing-over of the signal connections (clock and data). IC1 and IC2 are put to work as double pole changeover switches. To prevent short-circuiting the signals from both PCs, IC1 and IC2 are driven by a flip-flop with NOR-gates (IC3a and IC3b). Pushbuttons S1 and S2 change the state of the circuit. If both inputs of the flip-flop are made active, both outputs of the flip-flop will be ‘low’ and neither of the PCs is connected through. The LEDs D9 and D10 indicate which PC is currently connected to the keyboard and mouse. If no PC is connected then both LEDs are lit (this happens when





both S1 and S2 are pressed simultaneously). For a visually pleasing effect, the parts list indicates switches from ITT-Cannon with a red and green actuator so that the colour of the switches corresponds to the colour of the LEDs.

It is important that when the PC first starts up or re-boots the switch is in the correct position or no keyboard or mouse will be detected. In the first case the voltage that appears when the PC is switched on is used to trigger the flip-flop into the correct state: D3 and D7 for PC1, and D4 and D8 for PC2. R1/C1 and R2/C2 generate the reset pulses; the duration of nearly half a second is more than sufficient. R3 and R4 are necessary to discharge C1 and C2. Electrolytic capacitor C7 ensures proper decoupling of the power supply. The job of R7 is to limit the charging current through the BAT85 power supply diodes when the PS/2 cable is first connected.

The current consumption is about 1 mA and is almost entirely attributable to the LEDs. We conclude with a few things that are worth knowing. When shutting down the PC it appears that under Windows the mouse from certain manufacturers becomes deactivated. Make sure then, that when shutting down one PC, the other one is selected as quickly as possible, or this PC may not respond to the mouse any more. Also make sure that both PCs have the same mouse driver installed.

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COMPONENTS LIST

Resistors:

R1,R2 = 1MΩ
R3,R4 = 220kΩ
R5,R6 = 2kΩ7
R7 = 15Ω

Capacitors:

C1,C2 = 470nF
C3 = 10nF, lead pitch 5mm
C4,C5,C6 = 100nF ceramic, lead pitch 5mm
C7 = 100µF 10V radial

Semiconductors:

D1-D8 = BAT85
D9,D10 = red and green LED, 3mm, high efficiency
IC1,IC2 = 74HC4066
IC3 = 74HC02

Inductors:

L1 = 47µH

Miscellaneous:

K1-K6 = mini-DIN6/PS2 socket (female), PCB mount
S1,S2 = pushbutton, e.g., ITT/Cannon switch D6-C-40 (square, red) and/or D6-C-50 (square, green); optional snap-on button BTN-D6-40 (red) BTN-D6-50 (green)
PCB, order code **024068-1**